CLAIMS:

1. An isolated nucleic acid segment comprising a full length sequence or the full length complement of a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85.

2. An isolated nucleic acid molecule, of a size between about 14 and 100 bases in length, identical in sequence to a contiguous portion of at least 14 bases of a nucleic acid or its complement selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85.

3. The isolated nucleic acid molecule of claim 2, of a size of between about 17 and 100 bases in length.

4. The isolated nucleic acid molecule of claim 2, of a size of between about 20 and 100 bases in length.

5. The isolated nucleic acid molecule of claim 2, of a size of between about 25 and 100 bases in length.

6. The isolated nucleic acid molecule of claim 2, of a size of between about 30 and 100 bases in length.

7. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:1.

8. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:2.

9. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:3.

10. The isolated nucleic acid according to claim 1 wherein the sequence is SEQ ID NO:4.

11. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:5.

12. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:10.

13. The isolated nucleic acid according to claim 1 wherein the sequence is SEQ ID NO:11.

14. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:12.

15. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:13.

16. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:15.

17. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:16.

18. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:17.

19. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:19.

20. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:20.

21. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:21.

22. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:22.

23. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:23.

24. The isolated nucleic acid according to claim 1 wherein the sequence is SEQ ID NO:45.

25. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:46.

26. The isolated nucleic acid according to claim 1 wherein the sequence is SEQ ID NO:83.

27. The isolated nucleic acid according to claim 1, wherein the sequence is SEQ ID NO:85.

28. An isolated polypeptide with an amino acid sequence encoded by a polynucleotide having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45 and SEQ ID NO:46.

29. An isolated peptide, of a size between 10 and 50 amino acids in length, with an amino acid sequence encoded within a polynucleotide having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45 and SEQ ID NO:46.

30. A method for identifying markers for human prostate cancer, comprising the following steps:

a) providing human prostate RNAs;

b) amplifying said RNAs to provide nucleic acid amplification products;

c) separating said nucleic acid amplification products; and

d) identifying those RNAs that are differentially expressed between human prostate cancers *versus* normal or benign human prostate.

31. The method according to claim 30, further comprising converting said RNAs into cDNAs using reverse transcriptase prior to amplification.

32. The method according to claim 31, further comprising amplifying the cDNAs by polymerase chain reaction (PCR) using arbitrarily chosen oligonucleotide primers under initially reduced stringency conditions.

33. The method according to claim 31, further comprising:

a) using one oligo dT anchoring primer and an arbitrarily chosen oligonucleotide primer for the reverse transcription step; and

b) using an oligo dT anchoring primer and an arbitrarily chosen oligonucleotide primer for the amplification step.

34. A method for detecting prostate cancer cells in a biological sample comprising the step of detecting a prostate cancer marker in said sample, wherein said prostate cancer marker is a nucleic acid having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85.

35. The method of claim 34, further comprising the steps of

a) providing nucleic acids from said sample;

b) amplifying said nucleic acids to form nucleic acid amplification products;

c) contacting said nucleic acid amplification products with an oligonucleotide probe that will hybridize under stringent conditions with said prostate cancer marker;

d) detecting the nucleic acid amplification products which hybridize with said probe; and

e) measuring the amount of said nucleic acid amplification products that hybridize with said probe.

36. The method of claim 35, in which said oligonucleotide probe is selected to bind specifically an isolated nucleic acid having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85.

37. The method of claim 35, in which the sequence of said oligonucleotide probe is selected to bind specifically to a nucleic acid product of a known gene, said nucleic acid product selected from a group consisting of cyclin A (SEQ ID NO:8), fibronectin (SEQ ID NO:7), and a truncated form of Her2/neu (SEQ ID NO:9).

38. The method of claim 35, in which the sequence of said oligonucleotide probe is selected to bind specifically to a truncated nucleic acid product of the Her2/neu gene.

39. The method of claim 35, in which the sequence of said oligonucleotide probe is selected to bind specifically to a nucleic acid product of the cyclin A gene.

40. The method of claim 35, in which the sequence of said oligonucleotide probe is selected to bind specifically to a nucleic acid product of the fibronectin gene.

41. The method of claim 34, further comprising the steps of

a) providing nucleic acids from said sample;

b) providing primers that will selectively amplify said prostate cancer marker;

c) amplifying said nucleic acids with said primers to form nucleic acid amplification products;

d) detecting said nucleic acid amplification products; and

e) quantifying said nucleic acid amplification products.

42. The method of claim 41, wherein said primers are selected to amplify a nucleic acid having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85.

43. The method of claim 41, wherein said primers are selected to amplify a nucleic acid product of a known gene, said nucleic acid product selected from a group consisting of cyclin A, fibronectin, and a truncated form of Her2/neu.

44. The method of claim 41, wherein said primers are selected to amplify a truncated nucleic acid product of the Her2/neu gene.

45. The method of claim 41, wherein said primers are selected to amplify a nucleic acid product of the cyclin A gene.

46. The method of claim 41, wherein said primers are selected to amplify a nucleic acid product of the fibronectin gene.

47. The method of claim 41, further comprising determining the prognosis of prostate cancer patients by quantifying the nucleic acid amplification product binding to a probe specific for said prostate cancer marker.

48. The method of claim 41, further comprising determining the diagnosis of human prostate cancer by quantifying the nucleic acid amplification product binding to a probe specific for said prostate cancer marker.

49. The method of claim 41, further comprising determining the prognosis of prostate cancer patients by quantifying the nucleic acid amplification product.

50. The method of claim 41, further comprising determining the diagnosis of human prostate cancer by quantifying the nucleic acid amplification product.

51. A method of treating individuals with prostate cancer, comprising the steps of:

a) obtaining a sample of tissue from an individual with prostate cancer;

b) screening said sample for the expression of a polypeptide encoded by a polynucleotide having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85;

c) providing an antibody that reacts immunologically against said polypeptide; and

d) administering an effective amount of said antibody to an individual with prostate cancer.

52. A method of treating individuals with prostate cancer, comprising the steps of:

a) obtaining a sample of tissue from an individual with prostate cancer;

b) screening said sample for the expression of a polynucleotide having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, , SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85;

c) providing an antisense DNA molecule that encodes an RNA molecule that binds to said polynucleotide;

d) providing said antisense DNA molecule in the form of a human vector containing appropriate regulatory elements for the production of said RNA molecule; and

e) administering an effective amount of said vector to an individual with prostate cancer.

53. A kit for use in detecting prostate cancer cells in a biological sample, comprising:

(a) a primer pair for amplifying a nucleic acid having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85; and

(b) containers for each of said primers.

54. A kit for use in detecting prostate cancer cells in a biological sample, comprising:

(a) a primer pair for amplifying a nucleic acid product of a human gene, said nucleic acid product selected from a group consisting of cyclin A, fibronectin, and a truncated form of Her2/neu; and

(b) containers for each of said primers.

55. A kit for use in detecting prostate cancer cells in a biological sample, comprising:

(a) an oligonucleotide probe which binds under high stringency conditions to an isolated nucleic acid having a sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85; and

(b) a container for said probe.

56. A kit for use in detecting prostate cancer cells in a biological sample, comprising:

(a) an oligonucleotide probe which binds under high stringency conditions to a nucleic acid product of a human gene, said nucleic acid product selected from a group consisting of cyclin A, fibronectin gene, and a truncated form of Her2/neu; and

(b) a container for said probe.

57. A kit for use in detecting prostate cancer cells in a biological sample, comprising:

(a) an antibody which binds immunologically to a protein having an amino acid sequence encoded by a nucleic acid sequence selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85; and

(b) a container for said antibody.

58. A method for detecting prostate cancer cells in biological samples, comprising the following steps:

(a) providing an antibody that binds immunologically to a peptide, said peptide encoded by an isolated nucleic acid selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85, cyclin A, fibronectin, and a truncated form of Her2/neu;

(b) contacting a human tissue sample with said antibody;

(c) separating antibody bound to said tissue sample from unbound antibody; and

(d) detecting the bound antibody.

59. A kit for use in detecting prostate cancer cells in a biological sample, comprising:

(a) an antibody which binds immunologically to a polypeptide having an amino acid sequence encoded by a nucleic acid selected from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83 and SEQ ID NO:85, cyclin A, fibronectin, and a truncated form of Her2/neu; and

(b) a container for said antibody.

60. A method for treating individuals with prostate cancer, comprising the following steps:

(a) selecting a prostate cancer marker from a group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:83, SEQ ID NO:85, cyclin A, fibronectin, and a truncated form of Her2/neu;

(b) providing an inhibitor designed to bind specifically to the protein product of said prostate cancer marker; and

(c) administering an effective dosage of said inhibitor to a prostate cancer patient.

61. An isolated nucleic acid segment useful as a marker of bladder cancer or breast cancer and having a sequence or the full length complement of a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85.

62. An isolated nucleic acid molecule, of a size between about 14 and 100 bases in length, identical in sequence to a contiguous portion of at least 14 bases of a nucleic acid or its complement selected from the group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85.

63. An isolated polypeptide with an amino acid sequence encoded by a nucleic acid having a sequence selected from a group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85.

64. An isolated peptide, of a size between 10 and 50 amino acids in length, with an amino acid sequence encoded within a polynucleotide having a sequence selected from a group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85.

65. A method for detecting bladder cancer or breast cancer cells in a biological sample comprising the step of detecting a bladder cancer or breast cancer marker in said sample, wherein said bladder cancer or breast cancer marker is a nucleic acid having a sequence selected from a group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85.

66. The method of claim 65, further comprising the steps of

a) providing nucleic acids from said sample;

b) amplifying said nucleic acids to form nucleic acid amplification products;

c) contacting said nucleic acid amplification products with an oligonucleotide probe that will hybridize under stringent conditions with said bladder cancer or breast cancer marker;

d) detecting the nucleic acid amplification products which hybridize with said probe; and

e) quantifying the nucleic acid amplification products that hybridize with said probe.

67. The method of claim 65, further comprising the steps of

a) providing nucleic acids from said sample;

b) providing primers that will selectively amplify said bladder cancer or breast cancer marker;

c) amplifying said nucleic acids with said primers to form nucleic acid amplification products;

d) detecting said nucleic acid amplification products; and

e) quantifying said nucleic acid amplification products.

68. The method of claim 65, further comprising determining the prognosis of bladder cancer or breast cancer patients by quantifying the nucleic acid amplification product binding to a probe specific for said bladder cancer or breast cancer marker.

69. The method of claim 65, further comprising determining the diagnosis of human bladder cancer or breast cancer by quantifying the nucleic acid amplification product binding to a probe specific for said bladder cancer or breast cancer marker.

70. The method of claim 65, further comprising determining the prognosis of bladder cancer or breast cancer patients by quantifying the nucleic acid amplification product.

71. The method of claim 65, further comprising determining the diagnosis of human bladder cancer or breast cancer by quantifying the nucleic acid amplification product.

72. A method of treating individuals with bladder cancer or breast cancer, comprising the steps of:

a) obtaining a sample of tissue from an individual with bladder cancer or breast cancer;

b) screening said sample for the expression of a polypeptide encoded by a polynucleotide having a sequence selected from a group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85;

c) providing an antibody that reacts immunologically against said polypeptide; and

d) administering an effective amount of said antibody to an individual with bladder cancer or breast cancer.

73. A method of treating a subject with bladder cancer or breast cancer, comprising the steps of:

a) obtaining a sample of tissue from an individual with bladder cancer or breast cancer;

b) screening said sample for the expression of a polynucleotide having a sequence selected from a group consisting SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85;

c) providing an antisense DNA molecule that encodes an RNA molecule that binds to said polynucleotide;

d) providing said antisense DNA molecule in the form of a human vector containing appropriate regulatory elements for the production of said RNA molecule; and

e) administering an effective amount of said vector to an individual with bladder cancer or breast cancer.

74. A kit for use in detecting bladder cancer cells or breast cancer cells in a biological sample, comprising:

a) a primer pair for amplifying a nucleic acid having a sequence selected from a group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85; and

b) containers for each of said primers.

75. A kit for use in detecting bladder cancer cells or breast cancer cells in a biological sample, comprising:

a) an oligonucleotide probe which binds under high stringency conditions to an isolated nucleic acid having a sequence selected from a group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85; and

b) a container for said probe.

76. A kit for use in detecting bladder cancer cells or breast cancer cells in a biological sample, comprising:

a) an antibody which binds immunologically to a protein having an amino acid sequence encoded by a polynucleotide having a sequence selected from a group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85; and

b) a container for said antibody.

77. A method for detecting bladder cancer cells or breast cancer cells in biological samples, comprising the following steps:

a) providing an antibody that binds immunologically to a polypeptide encoded by an isolated nucleic acid selected from a group consisting of SEQ ID NO:3, SEQ ID NO:83 and SEQ ID NO:85;

b) contacting a human tissue sample with said antibody;

c) separating antibody bound to said tissue sample from unbound antibody; and

d) detecting the bound antibody.

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